



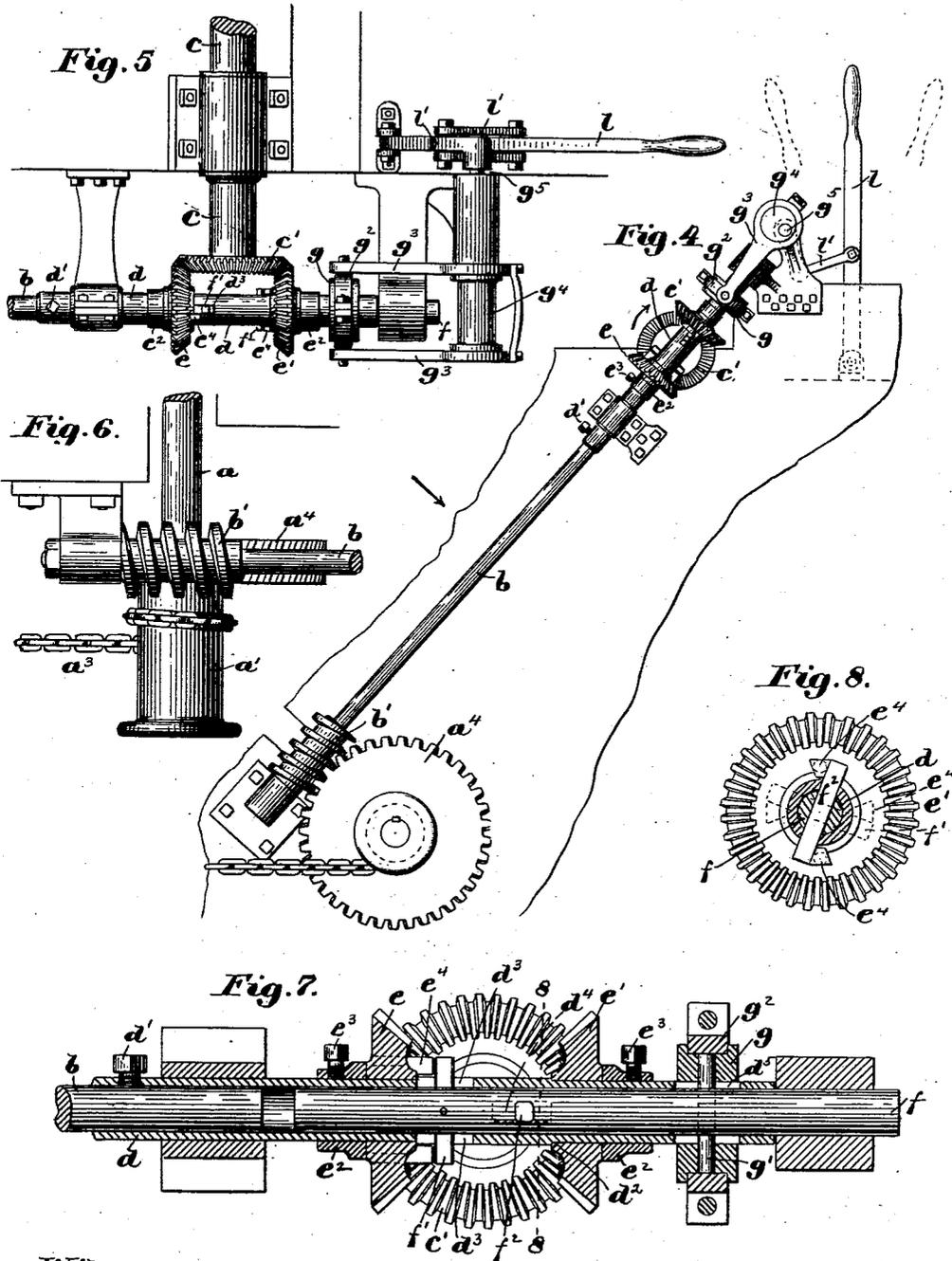
(No Model.)

2 Sheets—Sheet 2.

J. F. ADAMS.  
STEERING MECHANISM.

No. 571,964.

Patented Nov. 24, 1896.



Witnesses:

Walter E. Lombard.  
Thomas J. Drummond.

Inventor:

James F. Adams,  
by Crosby & Chiquy  
Attys.

# UNITED STATES PATENT OFFICE.

JAMES F. ADAMS, OF KILLINGLY, CONNECTICUT, ASSIGNOR TO C. D. & C.  
S. CHASE, OF DANIELSON, CONNECTICUT.

## STEERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 571,964, dated November 24, 1896.

Application filed July 6, 1896. Serial No. 598,133. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. ADAMS, of Killingly, in the county of Windham and State of Connecticut, have invented an Improvement in Steering Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to steering-gear for vehicles, being particularly intended for use in connection with steam road-rollers.

It is the main object of my invention to secure accuracy and certainty of operation with a minimum of wear and strain on the various parts of the steering mechanism.

To this end my invention comprises a connection with a power shaft and gear of the steam-roller in which two oppositely-rotating gears are in continuous engagement with the power-gear and are provided with clutch mechanism for throwing the same into and out of rotating engagement with the steering-shaft, as desired.

My invention will be more clearly apprehended and the details of construction thereof fully understood from the following complete description thereof, taken in connection with the accompanying drawings.

In the accompanying drawings, Figure 1 is a perspective view of my improved steering apparatus, showing the same in operative position on a steam road-roller, the latter being represented in dotted lines. Figs. 2 and 3 are side elevations of details of the steering apparatus, the former showing the sleeve and inclosed rod and the latter showing the rod removed from the sleeve. Fig. 4 is a side elevation of the complete mechanism shown in Fig. 1. Figs. 5 and 6 are respectively plan views of the upper and lower portions thereof, looking in the direction of the arrow, Fig. 4. Fig. 7 is a vertical longitudinal section of the upper portion of the steering apparatus; and Fig. 8 is a vertical cross-section thereof, taken on the line 8 8, Fig. 7.

As herein shown, my invention is applied to a steam road-roller, denoted in the drawings by the reference-letter A. Suitably mounted on the body of the roller is a transverse shaft  $a$ , having at either end a suitable

drum  $a'$ , connected with the axle of the front wheel  $a^2$  by the chains  $a^3$ . These chains are oppositely wound on the drum  $a'$ , so that as the shaft  $a$  is rotated one chain will wind on its drum as the other chain winds off, thereby skewing around the axle of the front wheel in order to steer the roller as desired. The shaft  $a$  is provided with a suitable connection to the steering-shaft  $b$ , this connection in the present instance being shown as consisting of a worm  $b'$  on the steering-shaft and a worm-gear  $a^4$  on the shaft  $a$ . The steering-shaft  $b$  derives its power from a power-shaft  $c$ , and it is the improved means for connecting these two shafts together and transmitting the power as desired from one to the other that constitutes my present invention.

The upper end of the steering-shaft  $b$  is provided with a sleeve  $d$ , fixed thereon by suitable means, (herein shown as a set-screw  $d'$ ,) and carrying two bevel-gears  $e e'$ , loosely mounted thereon and in continuous engagement with a bevel-gear  $c'$ , carried on the outer end of the power-shaft  $c$ . The gears  $e e'$  are held in place by any suitable means, shoulders  $d^2$  being herein shown as provided on the sleeve  $d$  to receive the inner ends of the gears, the outer ends thereof being held by collars  $e^2$ , adjusted on the sleeve by set-screws  $e^3$ .

The gears  $e e'$  engage the power-gear on opposite sides thereof, being thereby continuously driven in opposite directions, so that by throwing one or the other of them into fixed engagement with the steering-shaft  $b$  the latter is correspondingly rotated. In order to engage the gears, respectively, with the steering-shaft, I have provided clutch mechanism therefor, operated in the present instance by means of a rod  $f$ , extending within the sleeve  $d$ . This rod is shown in the present instance of my invention as having a reciprocating movement within the sleeve, although I do not restrict my invention in any wise to this particular movement. At its lower end the rod  $f$  is provided with projecting pins  $f' f^2$ , extending through slots  $d^3 d^4$ , provided therefor, through the walls of the sleeve  $d$ .

I have shown as the preferred form of my invention two pins  $f' f^2$ , extending perpendicularly to each other, the slots therefor in

the sleeve being correspondingly arranged. It is, however, within the scope of my invention to otherwise arrange these slots and pins, although the present arrangement is preferred for the reason that it distributes the strain over a greater surface of the sleeve and promotes an even balance of wear of the parts. The pins  $f'$   $f^2$  extend outwardly beyond the sleeve  $d$  and are adapted to engage suitable projections or recesses provided therefor in the adjacent inner ends of the loose gears  $e$   $e'$ . These projections are herein shown as formed by oppositely-disposed lugs  $e^1$ , driven into the inner faces of the gears  $e$   $e'$ . (See Fig. 8.)

In their normal intermediate position, as herein shown, the pins  $f'$   $f^2$  occupy an intermediate position between the lugs  $e^1$ , so that the two gears  $e$   $e'$  freely rotate on the sleeve without any liability of engaging the pins. In order, however, to rotate the driving-shaft, it is merely necessary to either lower or raise the rod  $f$ , so as to engage the pin  $f'$  with its gear  $e$  or the pin  $f^2$  with its gear  $e'$ , thereby correspondingly rotating the steering-shaft  $b$  and operating the chains  $a^3$  to steer the steam road-roller as desired.

In order to operate the rod  $f$  as desired, I have provided the same with a collar  $g$ , mounted thereon by means of a pin or bolt  $g'$ , fast in the rod  $f$ , slots  $d^5$  being provided therefor in the sleeve  $d$  in order to permit the necessary reciprocating movement of the rod  $f$ . This collar  $g$  is peripherally grooved to receive a band  $g^2$ , the latter carrying at opposite sides thereof the pivoted ends of the eccentric-straps  $g^3$ , the latter being carried at their upper ends by the eccentrics  $g^4$ , mounted on the shaft  $g^5$  and controlled by the lever  $l$  and like connection  $l'$ .

If it is desired to change the course of the steam road-roller to the right, all that is necessary is to pull the handle  $l$  backward in order to engage the pin  $f^2$  with the upper gear  $e'$ , and if it is desired to change the course of the steam road-roller to the left the handle  $l$  is simply pushed forward, thereby clutching the gear  $e$  with the steering-shaft  $b$ . Having properly directed the roller, the lever  $l$  is restored to its normal intermediate position, as shown in heavy lines, Fig. 4, and thereby the steering-shaft  $b$  is rendered inactive. It will be apparent that in my improved construction there is no throwing into and out of gear of the gear-wheels, but that the latter are always in mesh with the driving-gear, being continuously rotated thereby and brought into operative engagement with the steering-shaft at such times as desired.

While I have herein shown the preferred form of my clutch mechanism for causing this engagement, I do not restrict myself thereto, inasmuch as many changes may be resorted to without departing from the spirit and scope of this feature of my invention.

I have herein shown the rod  $f$  as provided with extensions in the form of pins, and I

have shown these as operating between the driven gears. It is obvious, however, that one extension may be used and also that the clutch mechanism might be operated from the opposite sides of the two gears and that the same might be varied in various other ways.

What I claim is—

1. In a steering mechanism, the combination with a power-shaft and its gear-wheel, of a steering-shaft, provided at its upper end with a sleeve, two gear-wheels loosely mounted on said sleeve, in engagement with and continuously driven in opposite directions by said power gear-wheel, a rod operating within said sleeve, clutch mechanism operated by said rod to engage either of said driven gears with and to rotate the steering-shaft, and means to operate said rod, substantially as described.

2. In a steering mechanism, a power-shaft, and its gear-wheel, combined with a steering-shaft having a sleeve projecting therefrom, a slot in the sleeve, two gear-wheels, loosely mounted on the sleeve and in continuous engagement with said power-gear, a rod extending within said sleeve, and means to operate the rod, said rod being provided with an extension working through said slot and adapted to be thrown into and out of clutching engagement with said loose gear-wheels, substantially as described.

3. In a steering mechanism, a power-shaft, and its gear-wheel, combined with a steering-shaft having a sleeve projecting therefrom, two gear-wheels loosely mounted on said sleeve and in continuous engagement with said power-gear, said sleeve being slotted between said two gears, and the latter being provided with lugs adjacent the slotted portion of said sleeve, a rod extending within said sleeve, and clutch mechanism to engage either of said two gears with said steering-shaft, said clutch mechanism being operated by said rod through said slotted sleeve, substantially as described.

4. In a steering mechanism, a power-shaft, and its gear-wheel, combined with a steering-shaft having a sleeve projecting therefrom, two gear-wheels loosely mounted on said sleeve and in continuous engagement with said power-gear, said sleeve being slotted between said two gears, and the latter being provided with lugs adjacent the slotted portion of said sleeve, a rod extending within said sleeve, pins fixed in said rod and extending through said slotted sleeve, and adapted to engage said lugs, and means to operate said rod, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. ADAMS.

Witnesses:

ARTHUR G. BILL,  
ANNIE E. LATHROP.